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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/761,765	01/18/2001	Charles Anderson	3633-501	5931

20582 7590 09/15/2003

PENNIE & EDMONDS LLP
1667 K STREET NW
SUITE 1000
WASHINGTON, DC 20006

[REDACTED] EXAMINER

PIZIALI, ANDREW T

[REDACTED] ART UNIT [REDACTED] PAPER NUMBER

1775

DATE MAILED: 09/15/2003

21

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/761,765	ANDERSON ET AL.	
	Examiner	Art Unit	
	Andrew T Piziali	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 24 July 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-3,11-16 and 20-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-3,11-16 and 20-25 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: On page 2, line 14, it appears that “ $5iO_2$ ” is suppose to read “ SiO_2 .” In addition, on page 9, line 6, it appears that “having in fact” should be deleted. Appropriate correction is requested.

Claim Objections

2. Claim 1 is objected to because of the following informalities: On page 9, lines 12-24, the applicant discloses that the currently claimed thickness ranges are optical thickness ranges as opposed to geometrical thickness ranges. Applicant is requested to amend claim 1 to clarify that the claimed thickness ranges are optical thickness ranges.

3. Claim 1 is objected to because of the following informalities: In line 8 it appears that the second “layer” should be deleted. Appropriate correction is requested.

4. Claim 24 is objected to because of the following informalities: It appears that claim 24 is suppose to depend on claim 23 because “the transparent polymer material” is disclosed in claim 23, but not in claim 22. Appropriate correction is requested.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1775

6. Claims 1-3, 11-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Publication No. 63-131101 to Yoshihiro et al. (hereinafter referred to as Yoshihiro) in view of USPN 4,798,994 to Rijpers et al. (hereinafter referred to as Rijpers).

Regarding claims 1-3, 11-14 and 16, Yoshihiro discloses a transparent substrate having at least one surface comprising an antireflection coating made of a multilayer stack having alternating thin layers of high and low refractive indices comprising a first high-index multilayer (14a and 14b) having a refractive index value of at most 2.40 comprising at least one titanium oxide layer (14b), a layer of low refractive index (13) having a refractive index of between 1.30 and 1.65, and a second high refractive index layer (12) having a refractive index of at most 2.30 (see entire document including Patent Abstract). Yoshihiro does not disclose (in the Patent Abstract) the thicknesses of the layers, but Rijpers discloses that it is understood by one of ordinary skill in the art that the layer thicknesses determine the optical performance properties such as transmittance and reflectance (see entire document including the paragraph bridging columns 3 and 4). Rijpers also discloses that it is known to make an antireflection coating comprising a 4-layer stack with high-low-high-low refractive indices with each sequential layer having a thickness on the order of $\lambda/8-\lambda/8-\lambda/2-\lambda/4$ in order to eliminate reflections at least over the range of wavelengths to which the eye is sensitive (see entire document including column 4, line 47 through column 5, line 9). It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the thickness' of the layers, as disclosed by Rijpers, because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Regarding claim 11, Yoshihiro discloses that the second high refractive index layer may have a refractive index of between 1.9 and 2.2 and may comprise tantalum oxide, zirconium oxide, tin oxide, indium oxide, zinc oxide, silicon nitride, or aluminum nitride (see entire document including Patent Abstract).

Regarding claim 12, Yoshihiro discloses that the first high-index multilayer may comprise a first layer that comprises titanium oxide and a second layer, wherein the first layer and the second layer are contiguous and the second high index layer is closer to the substrate than the first layer (see entire document including Patent Abstract).

Regarding claim 13, Yoshihiro discloses that the absolute difference between the refractive index of the second layer less the refractive index of the first layer may be between 0.1 and 0.6 (see entire document including Patent Abstract).

Regarding claim 14, Yoshihiro discloses that the low refractive index layer may comprise one or more of silicon oxide, aluminum oxide, aluminum oxyfluoride, aluminum fluoride, or magnesium fluoride, wherein the oxides are optionally halogenated (see entire document including Patent Abstract).

7. Claims 15 and 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshihiro in view of Rijpers as applied to claims 1-3, 11-14 and 16 above, and further in view of USPN 5,073,451 to Iida et al. (hereinafter referred to as Iida).

Regarding claim 15, Iida discloses that the low refractive index layers of a 4-layer high-low antireflection coating may comprise SiO_2 , Al_2O_3 , or $\text{SiO}_2\text{-Al}_2\text{O}_3$, and further discloses that the layer most removed from the substrate may comprise SiO_2 , Al_2O_3 , or a $\text{SiO}_2\text{-Al}_2\text{O}_3$ (column 7, lines 1-11 and column 7, lines 55-61). It would have been obvious to one having ordinary

Art Unit: 1775

skill in the art at the time the invention was made to make the thin layer of the antireflection coating most removed from the substrate a layer comprising SiO₂-Al₂O₃, as disclosed by Iida, because SiO₂, Al₂O₃, and SiO₂-Al₂O₃ are functionally equivalent low refractive index layers and because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Regarding claims 20-25, Iida discloses that a 4-layer high-low-high-low glass article may further include silver films and thereby exhibit electromagnetic shielding effects (column 6, lines 1-9). Iida also discloses that such a multilayer coating may be used as a vehicle windshield or a rear window glass by lamination with an uncoated transparent glass plate using any suitable plastic interlayer such as polyvinyl butryal (column 4, lines 4-53). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the antireflection coating of Yoshihiro include one or more silver films and/or any suitable plastic interlayer, as disclosed by Iida, because the article could then exhibit electromagnetic shielding effects and/or could be used as a vehicle windshield or a rear window glass.

Regarding claim 22, Iida discloses that the glass plate of a 4-layer high-low-high-low glass article may be either colorless or colored and that the glass may be curved (column 5, lines 44-56). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the glass of Yoshihiro colorless, colored and/or curved, as disclosed by Iida, because the material selection depends on the intended use and because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

8. Claims 1-3, 11-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Publication No. 60-081047 to Tatsuo et al. (hereinafter referred to as Tatsuo) in view of USPN 4,798,994 to Rijpers.

Regarding claims 1-3, 11-14 and 16, Tatsuo discloses a transparent substrate having at least one surface comprising an antireflection coating made of a multilayer stack having alternating thin layers of high and low refractive indices comprising a first high-index multilayer (2a and 3a) having a refractive index value of at most 2.40 comprising at least one titanium oxide layer (3a), a layer of low refractive index (3b) having a refractive index of between 1.30 and 1.65, and a second high refractive index layer (3a) having a refractive index of at most 2.30 (see Patent Abstract). Tatsuo does not disclose (in the Patent Abstract) the thicknesses of the layers, but Rijpers discloses that it is understood by one of ordinary skill in the art that the layer thicknesses determine the optical performance properties such as transmittance and reflectance (see entire document including the paragraph bridging columns 3 and 4). Rijpers also discloses that it is known to make an antireflection coating comprising a 4-layer stack with high-low-high-low refractive indices with each sequential layer having a thickness on the order of $\lambda/8-\lambda/8-\lambda/2-\lambda/4$ in order to eliminate reflections at least over the range of wavelengths to which the eye is sensitive (column 4, line 47 through column 5, line 9). It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the thickness' of the layers, as disclosed by Rijpers, because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Regarding claim 11, Tatsuo discloses that the second high refractive index layer may have a refractive index of between 1.9 and 2.2 and may comprise tantalum oxide, zirconium

Art Unit: 1775

oxide, tin oxide, indium oxide, zinc oxide, silicon nitride, or aluminum nitride (see entire document including Patent Abstract).

Regarding claim 12, Tatsuo discloses that the first high-index multilayer may comprise a first layer that comprises titanium oxide and a second layer, wherein the first layer and the second layer are contiguous and the second high index layer is closer to the substrate than the first layer (see entire document including Patent Abstract).

Regarding claim 13, Tatsuo discloses that the absolute difference between the refractive index of the second layer less the refractive index of the first layer may be between 0.1 and 0.6 (see entire document including Patent Abstract).

Regarding claim 14, Tatsuo discloses that the low refractive index layer may comprise one or more of silicon oxide, aluminum oxide, aluminum oxyfluoride, aluminum fluoride, or magnesium fluoride, wherein the oxides are optionally halogenated (see entire document including Patent Abstract).

9. Claims 15 and 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tatsuo in view of Rijpers as applied to claims 1-3, 11-14 and 16 above, and further in view of USPN 5,073,451 to Iida.

Regarding claim 15, Iida discloses that the low refractive index layers of a 4-layer high-low antireflection coating may comprise SiO_2 , Al_2O_3 , or $\text{SiO}_2\text{-Al}_2\text{O}_3$, and further discloses that the layer most removed from the substrate may comprise SiO_2 , Al_2O_3 , or a $\text{SiO}_2\text{-Al}_2\text{O}_3$ (column 7, lines 1-11 and column 7, lines 55-61). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the thin layer of the antireflection coating most removed from the substrate a layer comprising $\text{SiO}_2\text{-Al}_2\text{O}_3$, as disclosed by Iida,

Art Unit: 1775

because SiO₂, Al₂O₃, and SiO₂-Al₂O₃ are functionally equivalent low refractive index layers and because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Regarding claims 20-25, Iida discloses that a 4-layer high-low-high-low glass article may further include silver films and thereby exhibit electromagnetic shielding effects (column 6, lines 1-9). Iida also discloses that such a multilayer coating may be used as a vehicle windshield or a rear window glass by lamination with an uncoated transparent glass plate using any suitable plastic interlayer such as polyvinyl butryal (column 4, lines 4-53). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the antireflection coating of Tatsuo include one or more silver films and/or any suitable plastic interlayer, as disclosed by Iida, because the article could then exhibit electromagnetic shielding effects and/or could be used as a vehicle windshield or a rear window glass.

Regarding claim 22, Iida discloses that the glass plate of a 4-layer high-low-high-low glass article may be either colorless or colored and that the glass may be curved (column 5, lines 44-56). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the glass of Tatsuo colorless, colored and/or curved, as disclosed by Iida, because the material selection depends on the intended use and because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Response to Arguments

10. Applicant's arguments with respect to claims 1-3, 11-16 and 20-25 have been considered but are moot in view of the new grounds of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T Piziali whose telephone number is (703) 306-0145. The examiner can normally be reached on Monday-Friday (7:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (703) 308-3822. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-3822.

Andrew T Piziali
Examiner
Art Unit 1775

atp
August 14, 2003

DEBORAH JONES
SUPERVISORY PATENT EXAMINER